The width w2 of each of the diverging waveguides 12 is initially less than the critical width and then gradually increases to a width that is larger than the critical width and after that to a width equal to that of its respective output waveguide to this end, the gaps between the waveguides 12 follow a pattern in accordance with equations E1.

$$x = w_i\sqrt{1+(\alpha z)^2} \quad ; for \quad x>0 \quad \alpha = \frac{(\lambda / n_{eff})}{\pi w_o} \quad ; \quad w_i = i(gap + wg); \quad i = -10...10$$

The values used in the equation are w_0 = 1.0 μm; n= 3; λ = 1.545 μm; wg = 0.5 μm; and gap = 0.5 μm.

FIGURES 8B and 8C respectively show a cross sectional view of the waveguides along B-B and C-C as indicated by a corresponding pair of arrows. As shown in FIGURE 8B, a cross sectional view at the interface B-B shows that an inter-waveguide gap width w1 and a waveguide width w2 are substantially equal. On the other hand, a cross sectional view at the diverging portion C-C shows that an inter-waveguide gap width w1 is smaller than a waveguide width w2.

FIGURES 8D and 8E respectively show a cross sectional view of the waveguides along dotted lines A-A and A'-A' as indicated by a corresponding pair of arrows. As shown in FIGURE 8D, a cross sectional view along the line A-A shows that an inter-waveguide gap gradually deepens as the waveguides 12 diverges. On the other hand, a cross sectional view along the line A'-A' shows that the waveguide surface of the waveguides 6 and 12 maintain the substantially horizontal plane.